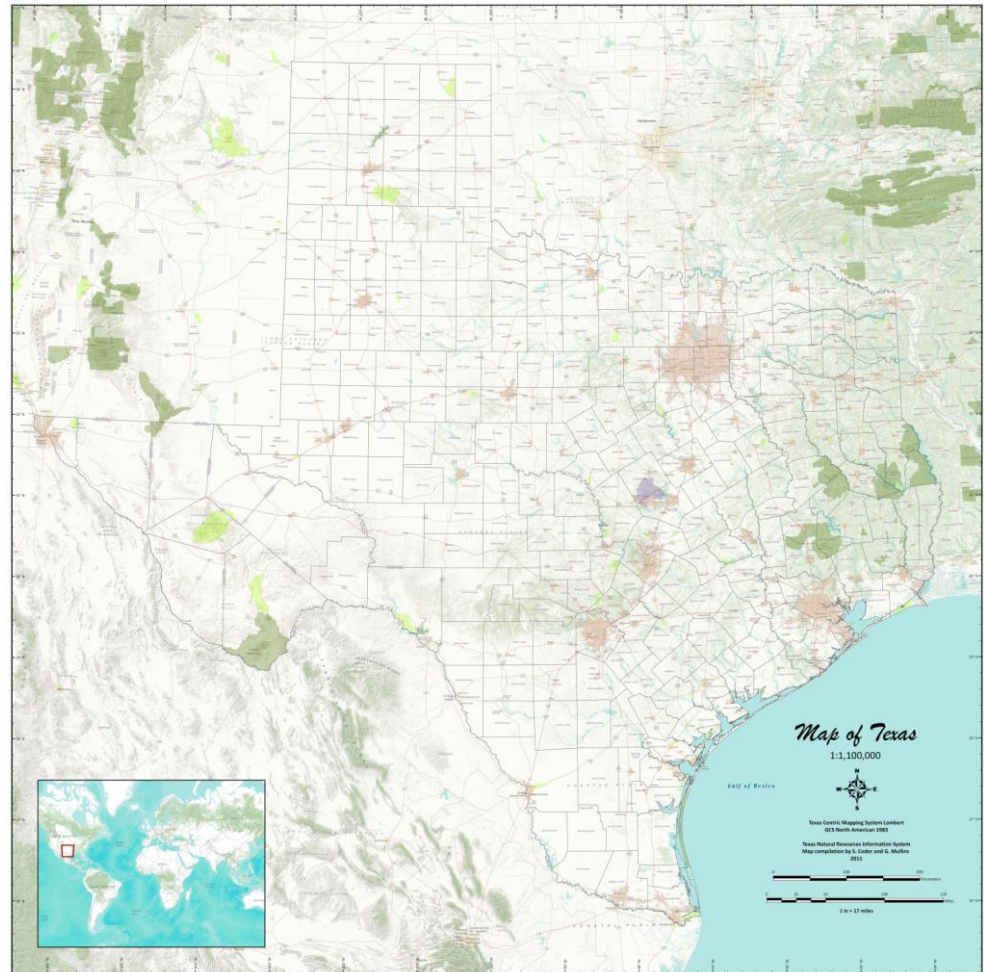


# The Changing Landscape of GIS

## A Texas Perspective



- A history of TNRIS and GIS in Texas (my version)
- Importance that census data played in Texas GIS
- How public domain concept continues to be the model for the future

*(Texas Water Code, 16.021)*

## TEXAS NATURAL RESOURCES INFORMATION SYSTEM.

...to serve Texas agencies and citizens as a centralized clearinghouse and referral center for:

- natural resource data;
- census data;
- data related to emergency management; and
- other socioeconomic data.

Why are we associated with  
the Texas Water Development Board?





# TEXAS WATER CODE

## § 11.070. Centralized Data

*The staff shall create a centralized data bank incorporating all hydrological data collected by state agencies. (55th Legis., Ch. 425, Sec. 21, subdiv. (j), as amended.)*

- Concept of TNRIS came from the drought and floods of the 1950's
- The "*Texas Water Planning Act*" of 1957 mandated a data planning inventory be established.
- In 1967 - the Texas Water Code was revised which directed the Texas Water Development Board to formally establish a centralized data bank officially known as the "*Texas Water Oriented Data Bank*".
- 1972 – the "*Texas Natural Resources Information System*" was officially established.





FILE DESC

TEXAS NATURAL RES

GEOGRAPHIC  
INFORMATION SYSTEM



User

Reference

Manual



SYSTEM

AGRICULTURE



# TEXAS CITIES WITH TNRIS MONITOR USERS



TEXAS NATURAL RESOURCES INFORMATION  
SYSTEM



USE OF THE  
**TNRIS MONITOR**  
FOR COMPUTER TERMINAL ACCESS  
TO NATURAL RESOURCES  
AND RELATED  
DATA AND INFORMATION



TEXAS NATURAL RESOURCES INFORMATION SYSTEM

# GEOGRAPHIC INFORMATION SYSTEM

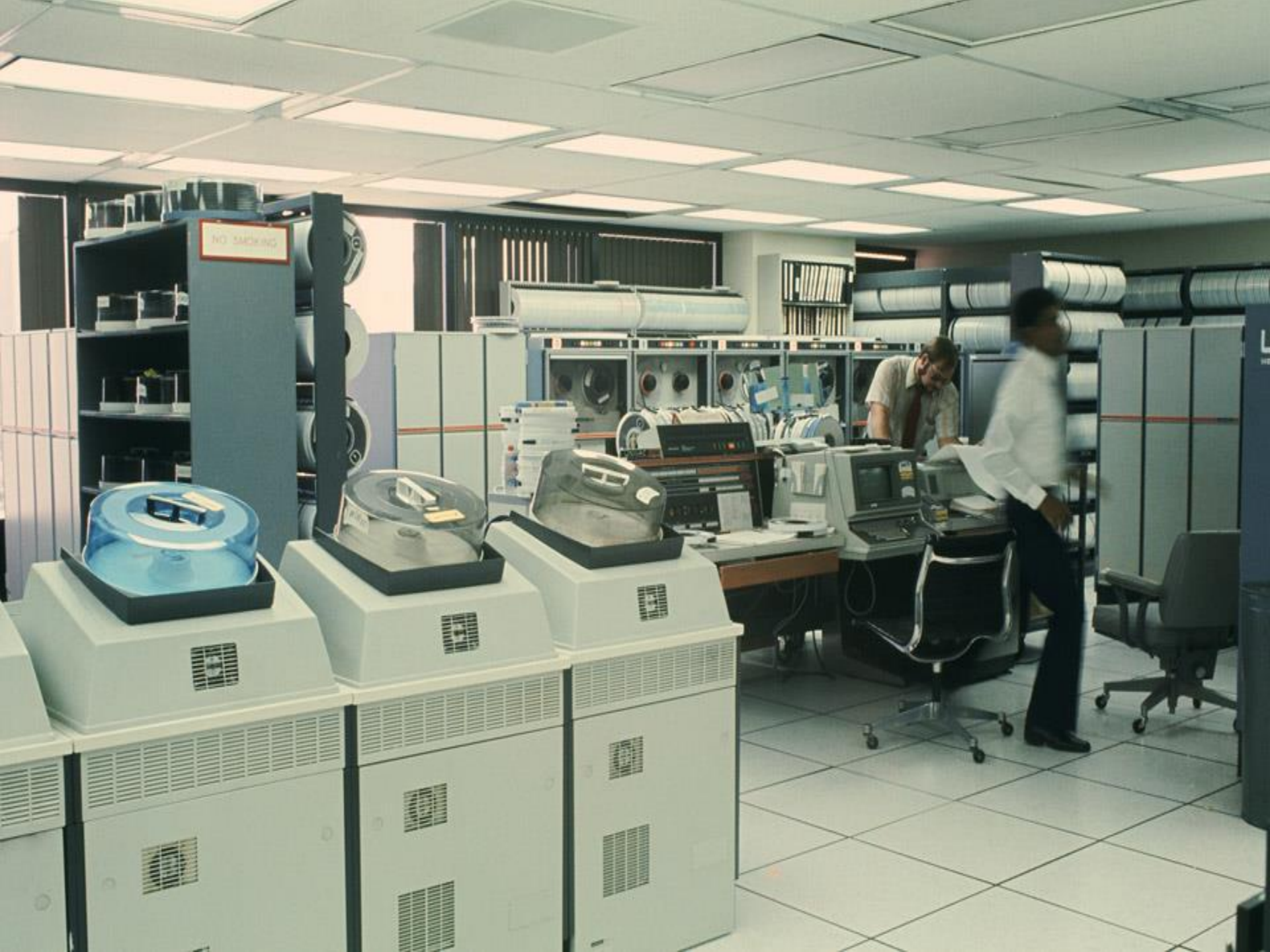


User

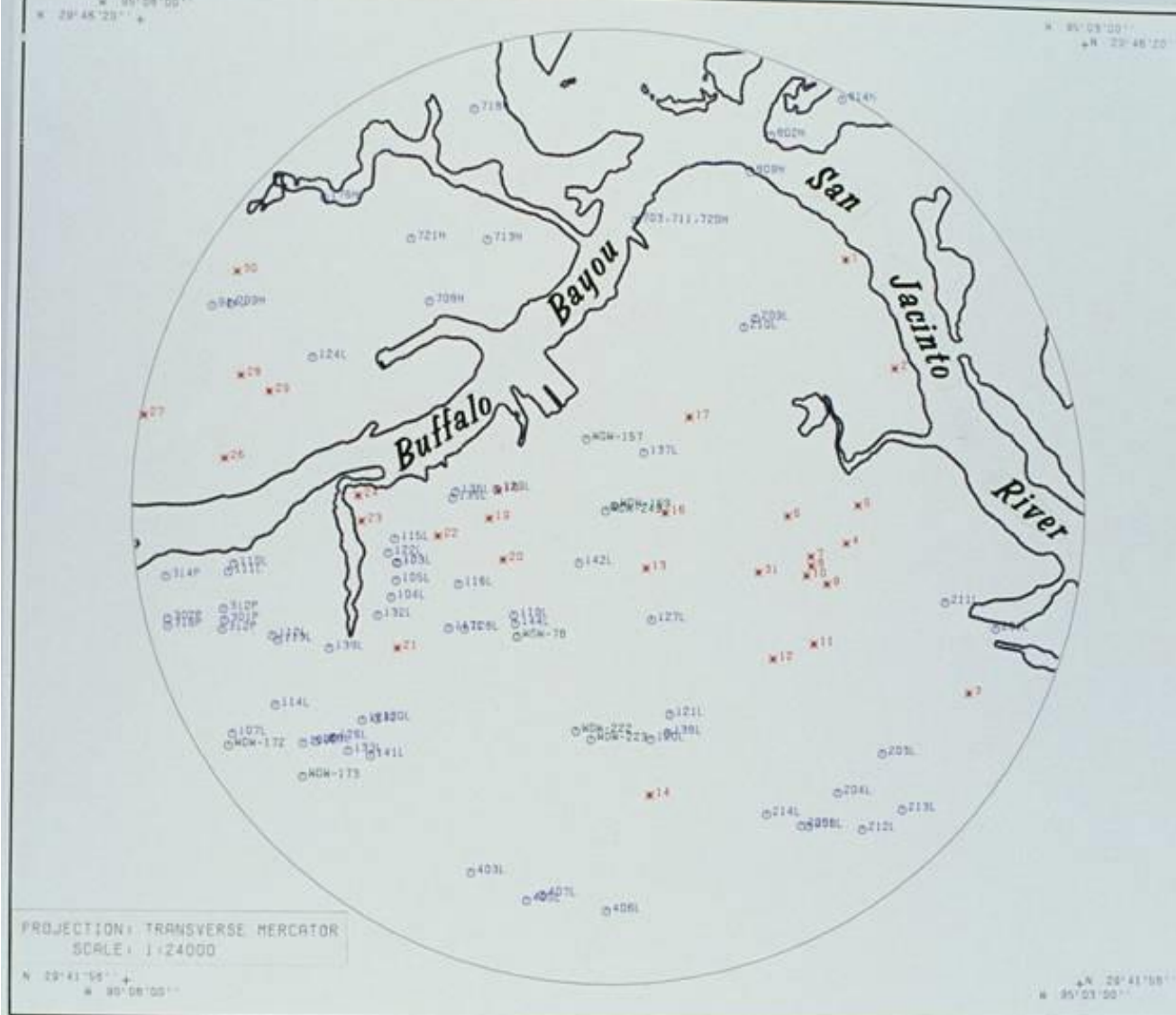
Reference

Manual









RESERVOIRS WITHIN 2.5 MILE RADIUS  
OF INJECTION WELL



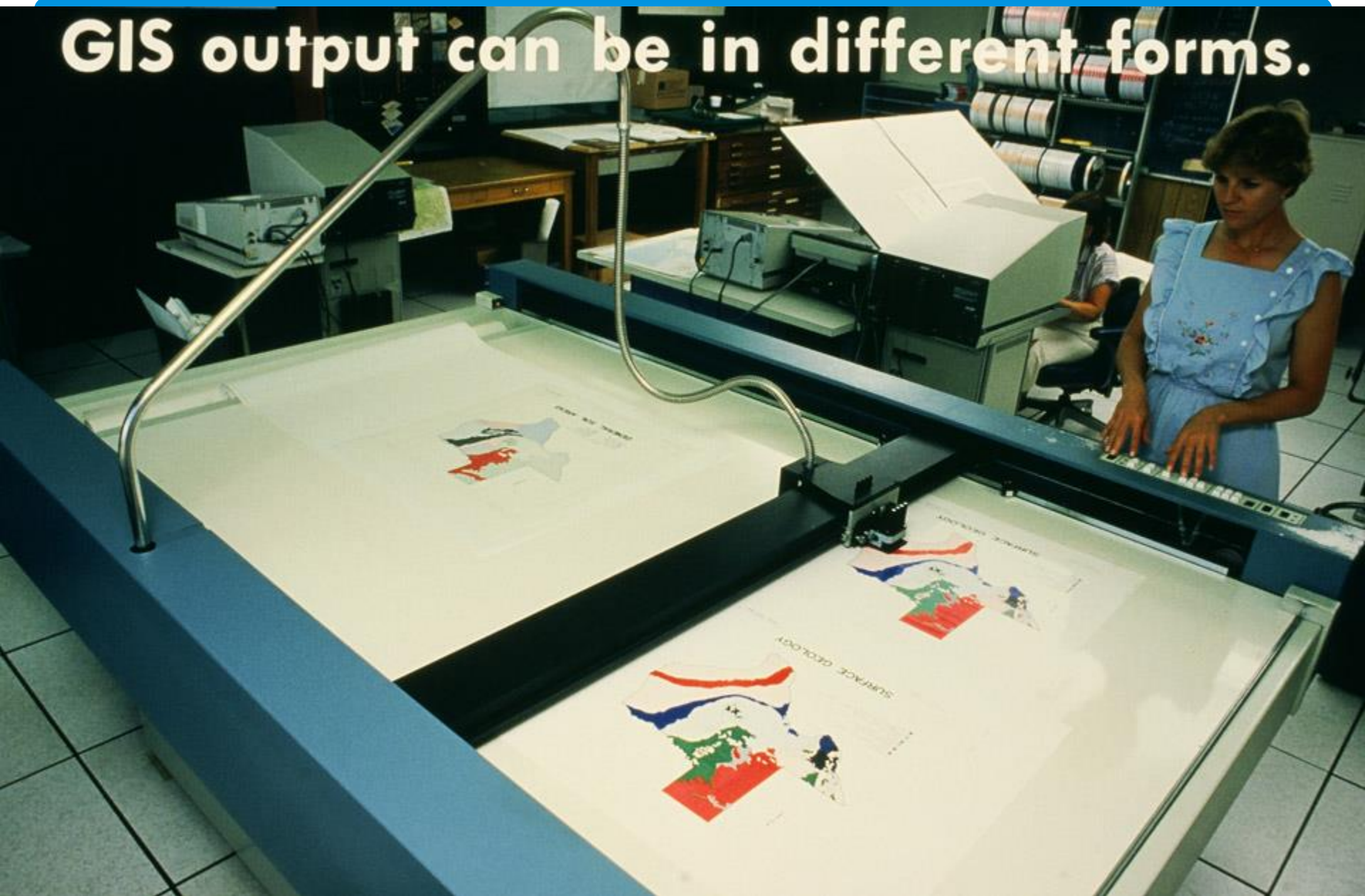








**GIS output can be in different forms.**



TEXAS NATURAL RESOURCES INFORMATION SYSTEM

# CENSUS

DATA SYSTEM

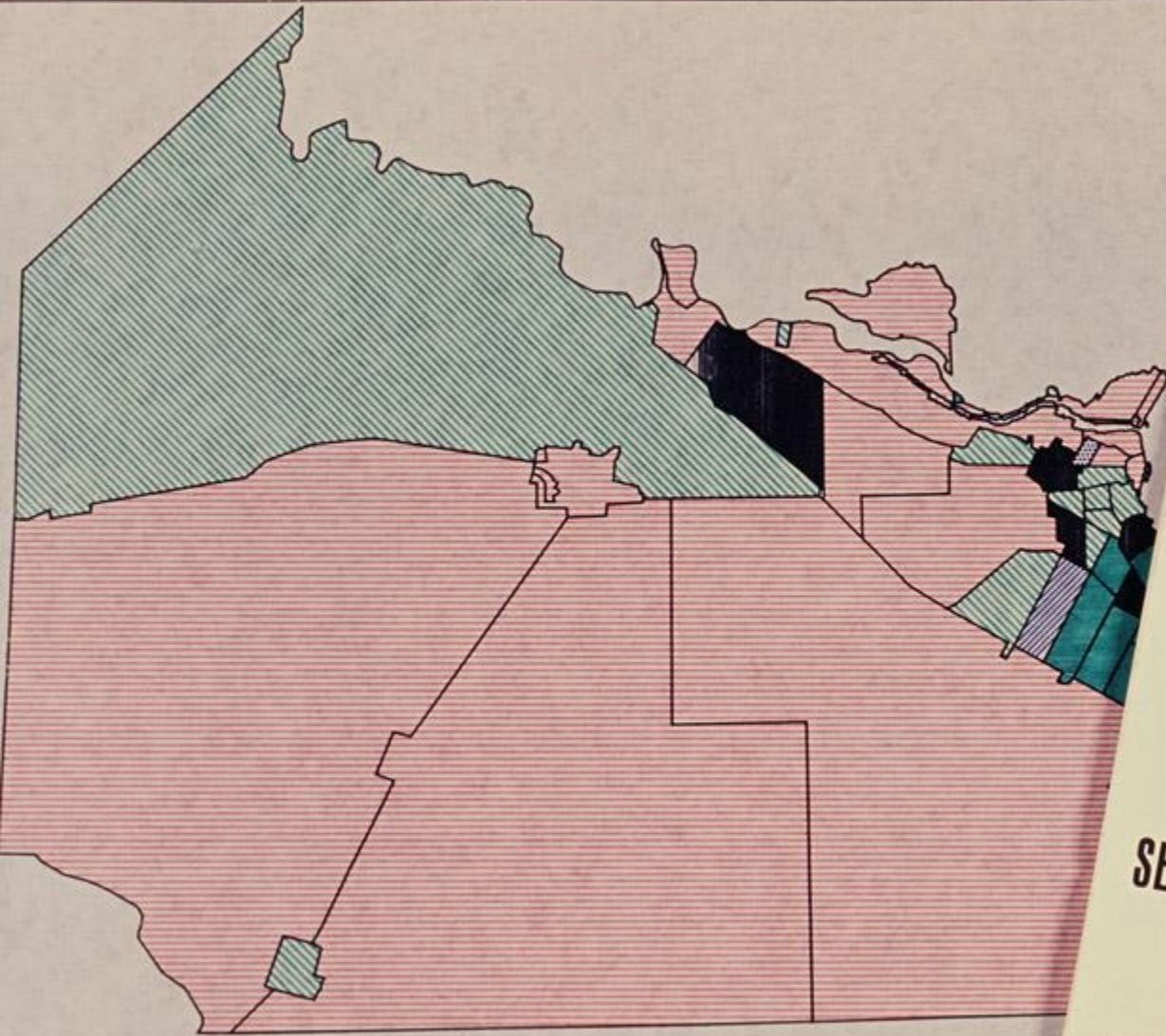


User

Reference

Manual





TEXAS NATURAL RESOURCES  
INFORMATION SYSTEM



**CENSUS DATA  
SERVICES AND CAPABILITIES**

TNRIS-004  
JULY 1978





# TNRIS Short Courses



**TNRIS Overview**

**TNRIS Census**

**TNRIS Monitor**





Miniature Study Guide

**Crop Surveys through  
Remote Sensing**  
by Shirley M. Davis &  
Marvin E. Bauer



In 1987  
something interesting happened!

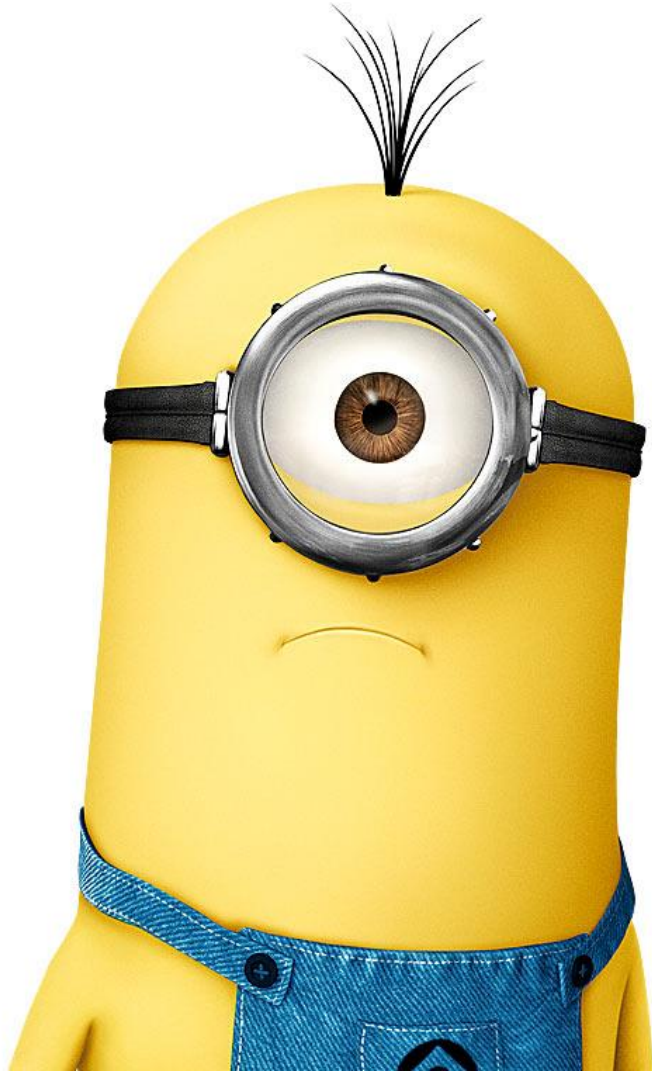
The Water Resources Department was  
split into two agencies.

The Texas Water Commission  
and the  
Texas Water Development Board

# TNRIS went to the Texas Water Development Board

But the **GIS** went to the  
Texas Water Commission

WAAAAAT !!



# TWC got this!



# TNRIS got this!







**STARTING  
OVER  
AGAIN**



Version 3.4.2b  
Upgrade Disk 1



**PC ARC/INFO**

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pcARC/INFO



Environmental Systems Research Institute  
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(714) 793-8800

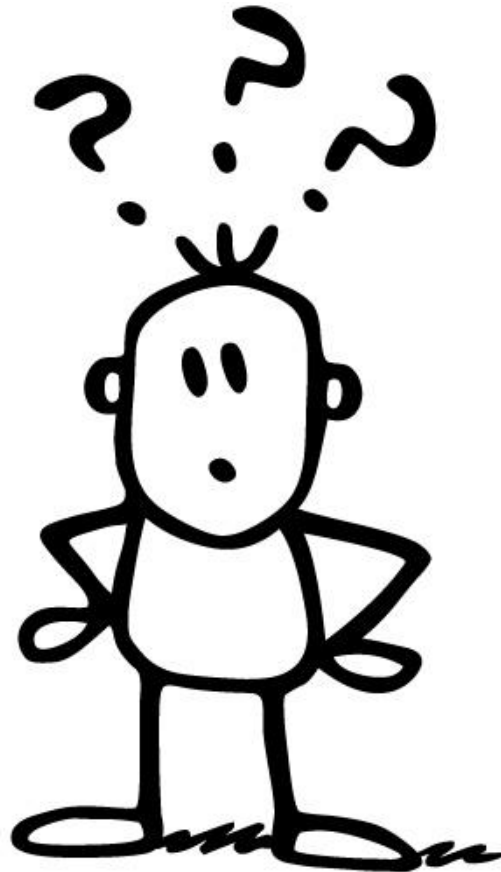


IBM

IBM



# Where do we get GIS data





# Census of Housing

U.S. Department of Commerce  
Bureau of the Census

## Census of Population and Housing

U.S. Department of Commerce  
Bureau of the Census

MICROFICHE

AUSTIN

05000  
(0210)

AIRPORT

21.09

21.07

21.08

22.03

Austin  
(05000)

Spocket  
700  
4000 CPM

PERSONS OF SPANISH ORIGIN AND RACE	11246808	TOTAL	1437204
NOT OF SPANISH ORIGIN	2794550	WHITE	1271761
MEXICAN	21956	BLACK	88398
PURIFIED MEXICAN	13616	AMERICAN INDIAN, ESKIMO, ALEUT, AND ASIAN AND PACIFIC ISLANDER	1110998
CUBAN		OTHER (TRACE NECI 151)	3230104
OTHER SPANISH			125426
WHITE, BLACK, AMERICAN INDIAN, ESKIMO, ALEUT, AND ASIAN AND PACIFIC ISLANDER (N)			825258
OTHER THREE NECI 151			428440

PERSONS 15 YEARS AND OVER BY SEX BY MARITAL STATUS	MALE	FEMALE
SINGLE	1437204	1110998
MARRIED, EX SEPARATED	1271761	3230104
SEPARATED	88398	125426
WIDOWED	107869	825258
DIVORCED	294933	428440



# Dual Independent Map Encoding (DIME)

- Developed as a way to link digital map files to the “address coding guide” to support the U.S. Census Bureau with Mail-out and Mail-back procedures for the 1970’s Census.
- Built upon a selection of streets, railroads, administrative boundaries, and hydrological features digitized from the Census Bureau’s Metropolitan Map Series (MMS) program.
- MMS map source files were the USGS 7.5 minute quads.

## AREAS DEFINED BY OFFICE OF MANAGEMENT AND BUDGET, FEBRUARY 1971

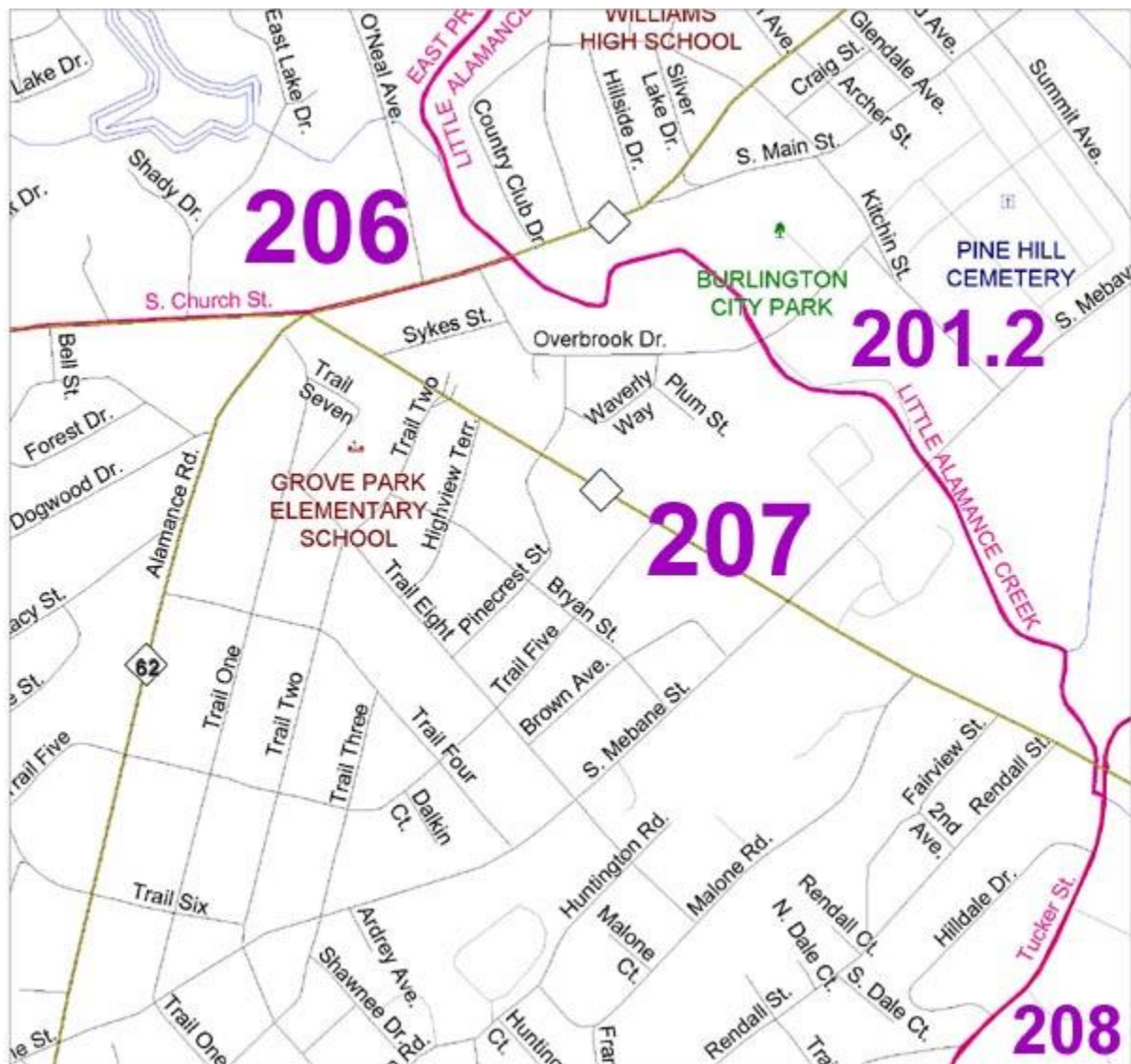


# Dual Independent Map Encoding (DIME)

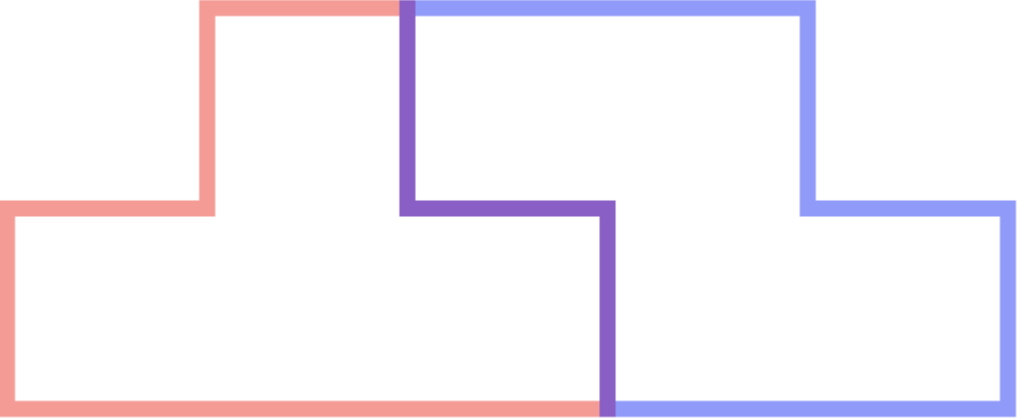
- Vector based data structure where intersections, streets, and blocks became analogous to points, lines, and polygons
- First to incorporate a basic topological data structure

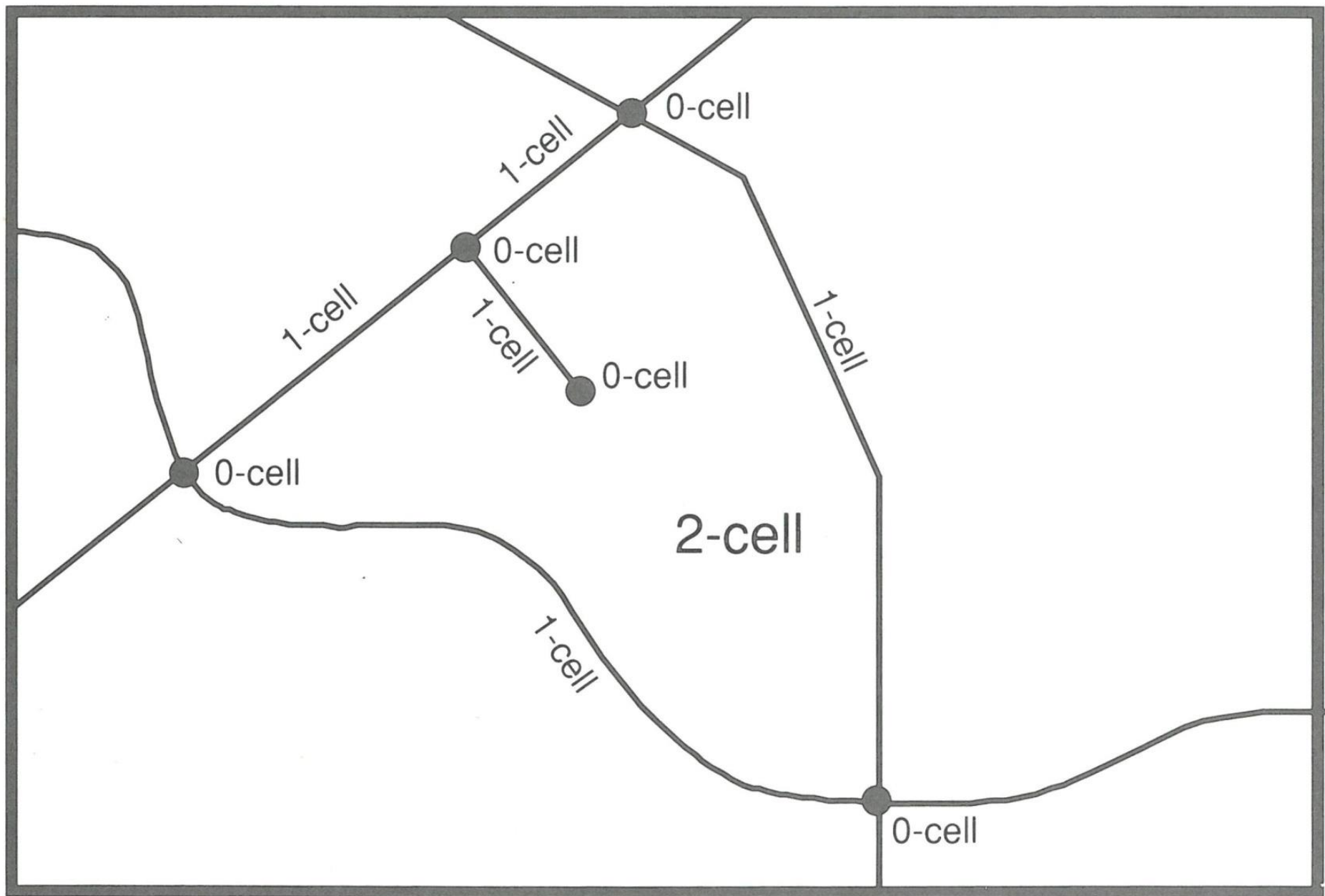
# What is Topology?

- Topology is the definition of how points, lines and polygons are spatially related to each other on the map



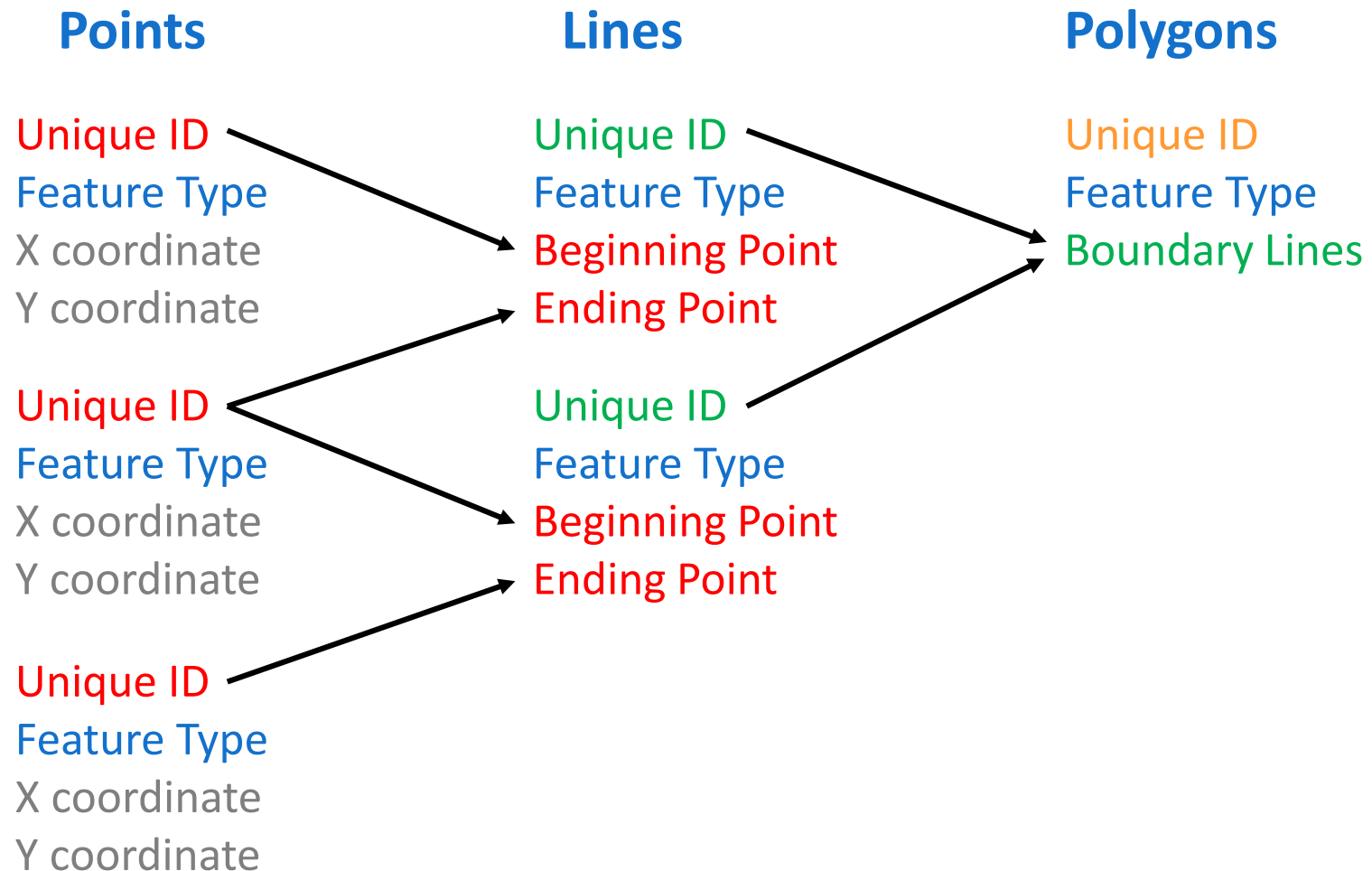


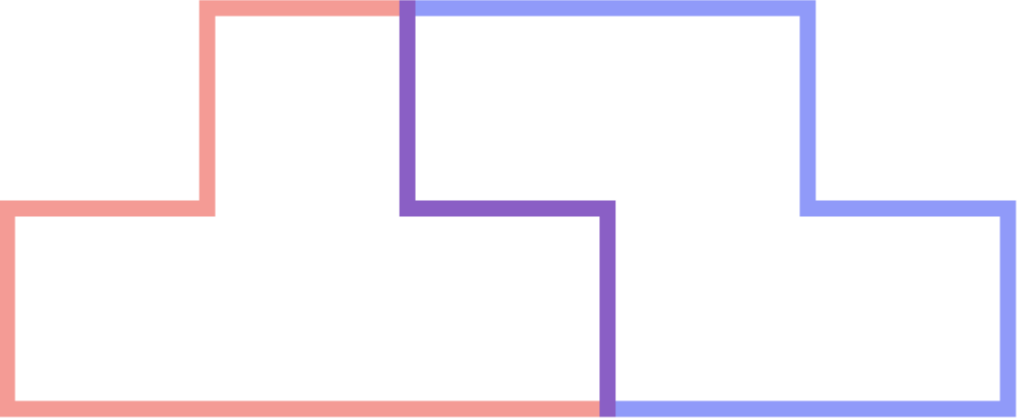




*0-cells are points; 1-cells are line segments; 2-cells are polygons*

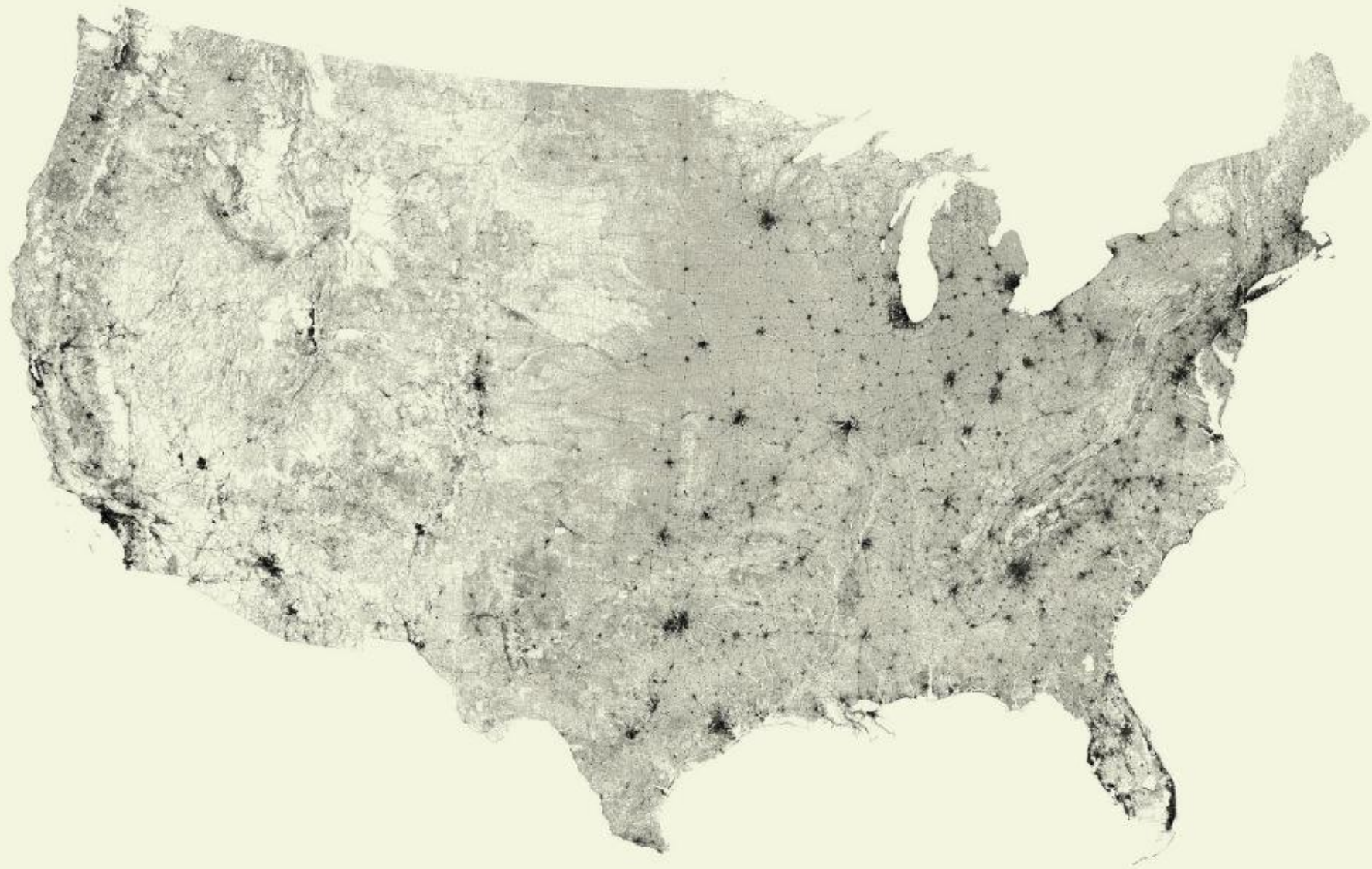
# General Topologic Relationship Scheme





# Topologically Integrated Geographic Encoding and Referencing (TIGER) Database

- A Collaborative effort between the Census Bureau and the U.S. Geological Survey (USGS) for the 1990 Census
- The TIGER database contained a latitude/longitude-coordinate for more than 30 million feature intersections and end points and nearly 145 million feature “shape” points that defined the more than 42 million feature segments that outlined more than 12 million polygons.
- National Coverage



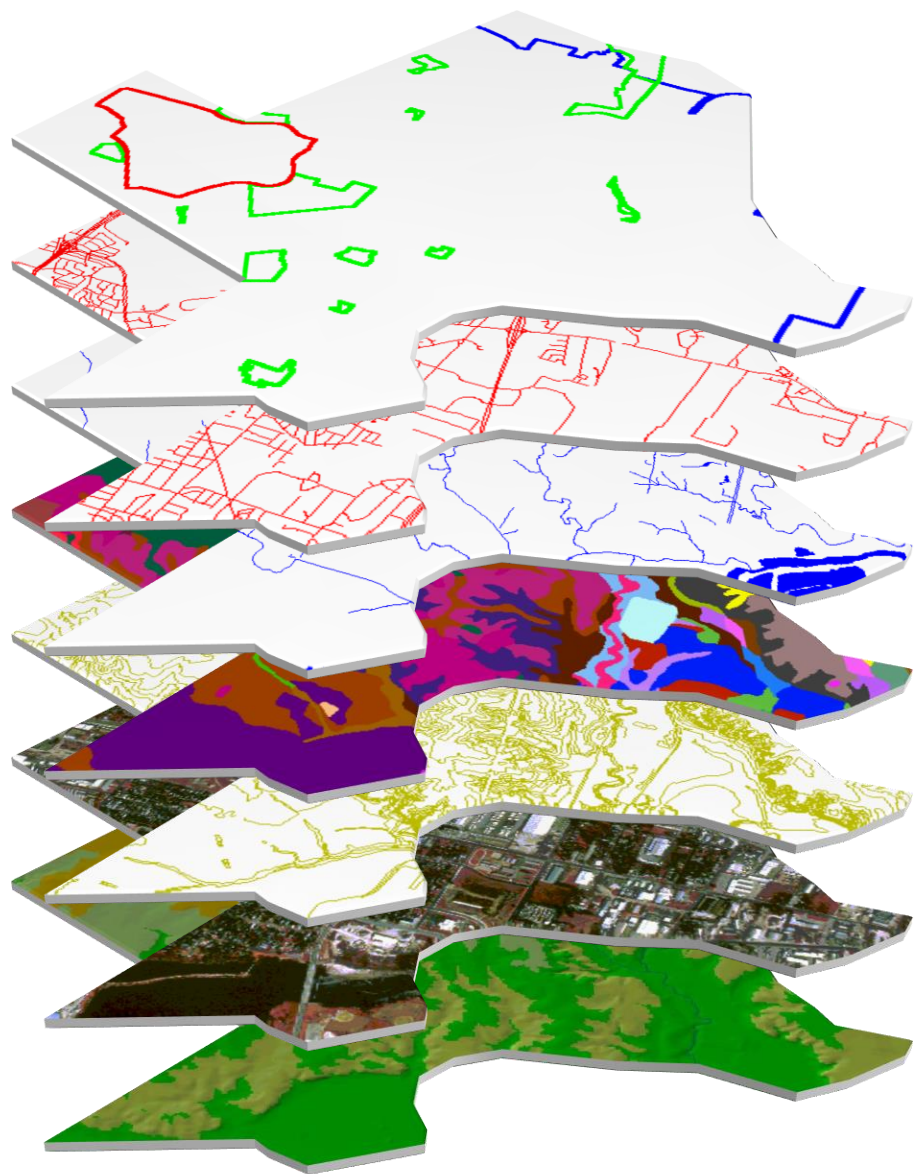
A large, solid red outline of the state of Texas, centered on the slide. The text "Present Day" is written in white, sans-serif font across the middle of the outline.

Present Day



# **StratMap**

**Texas, digitally remastered**



Boundaries

Transportation

Water Features

Soil Surveys

Contours

Digital Orthophoto Quadrangles

Digital Elevation Models

Data Layers Including but not limited to...

**Imagery**

**Elevation / Contours**

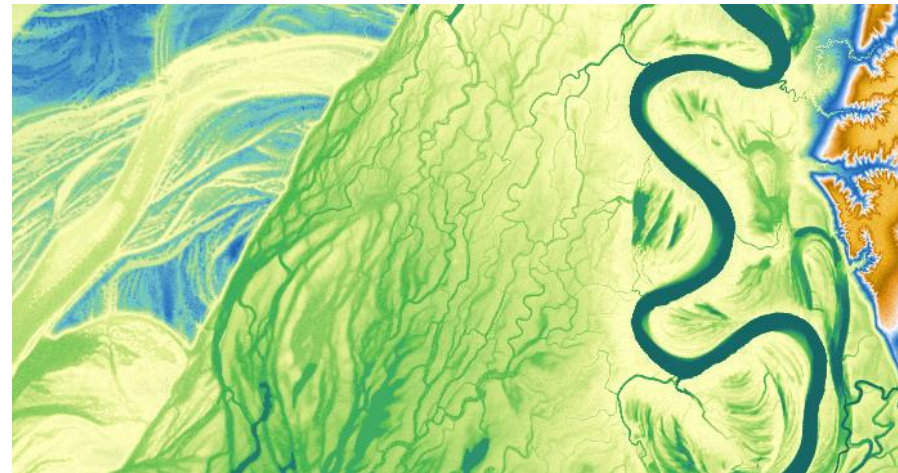
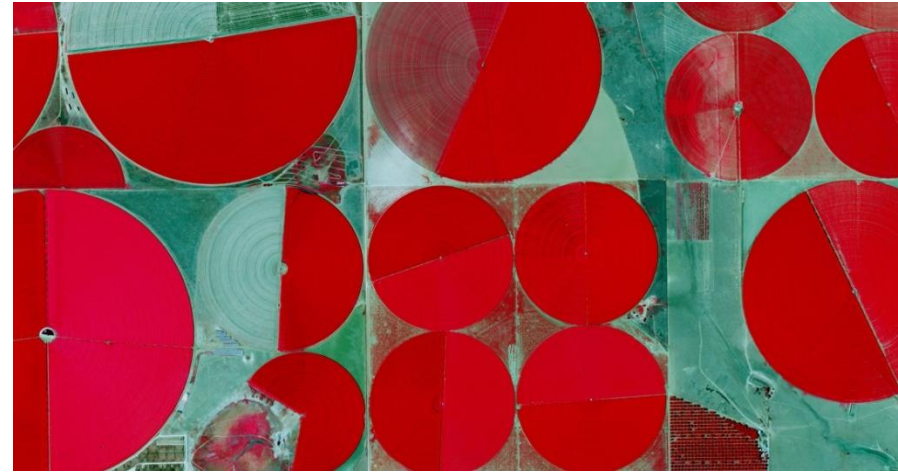
**Hydrography (surface water)**

Transportation

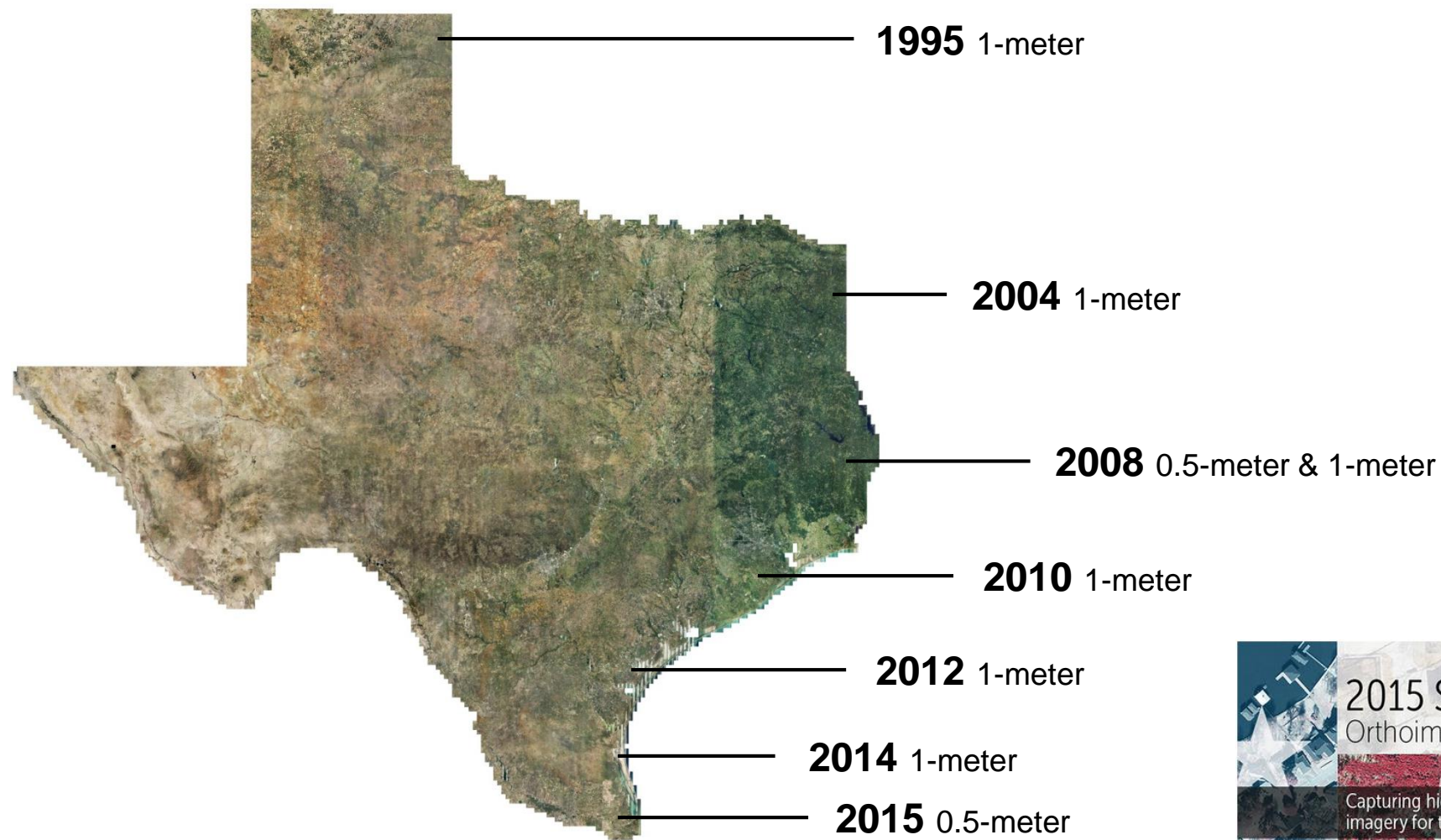
Political Boundaries

Soil Surveys

Land Cover

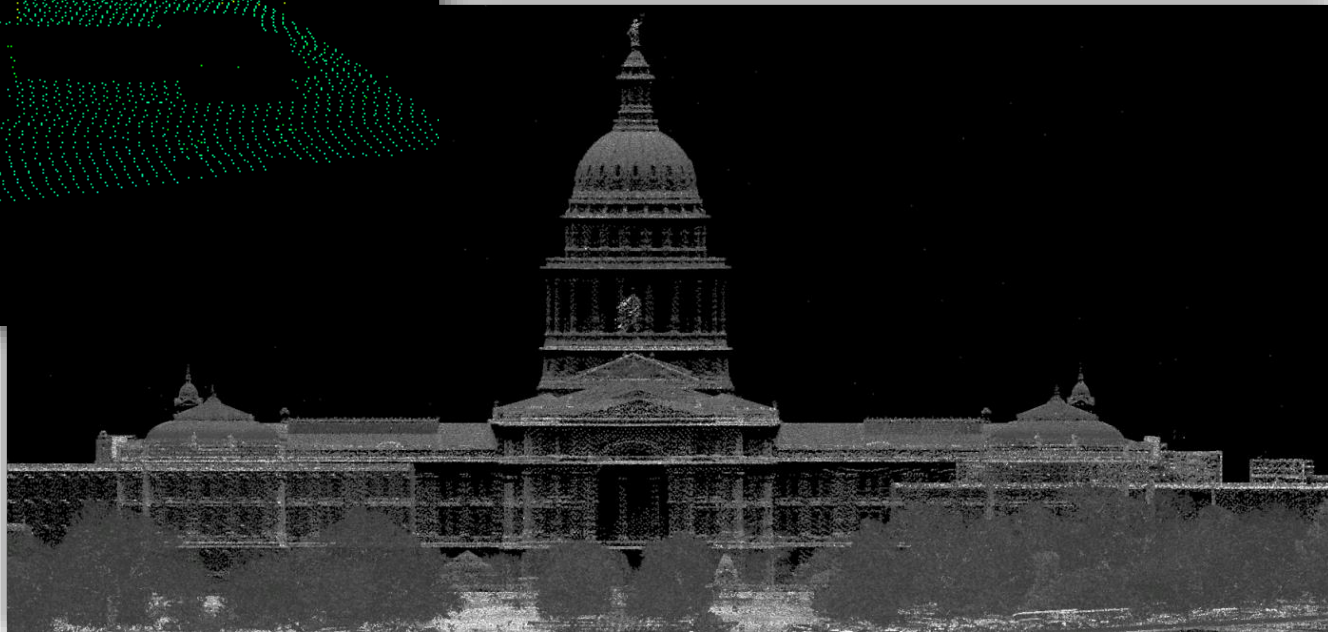
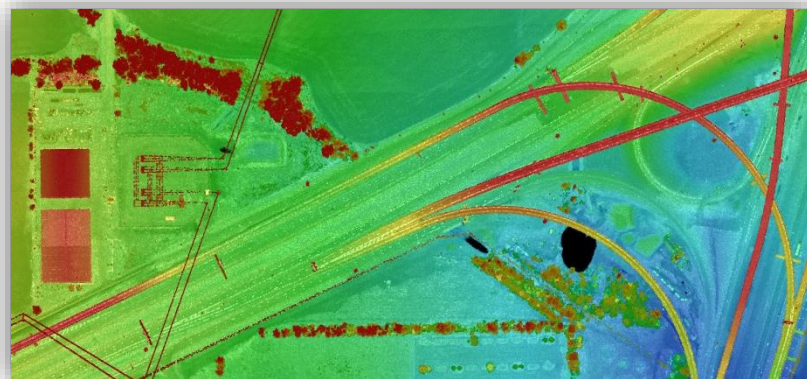
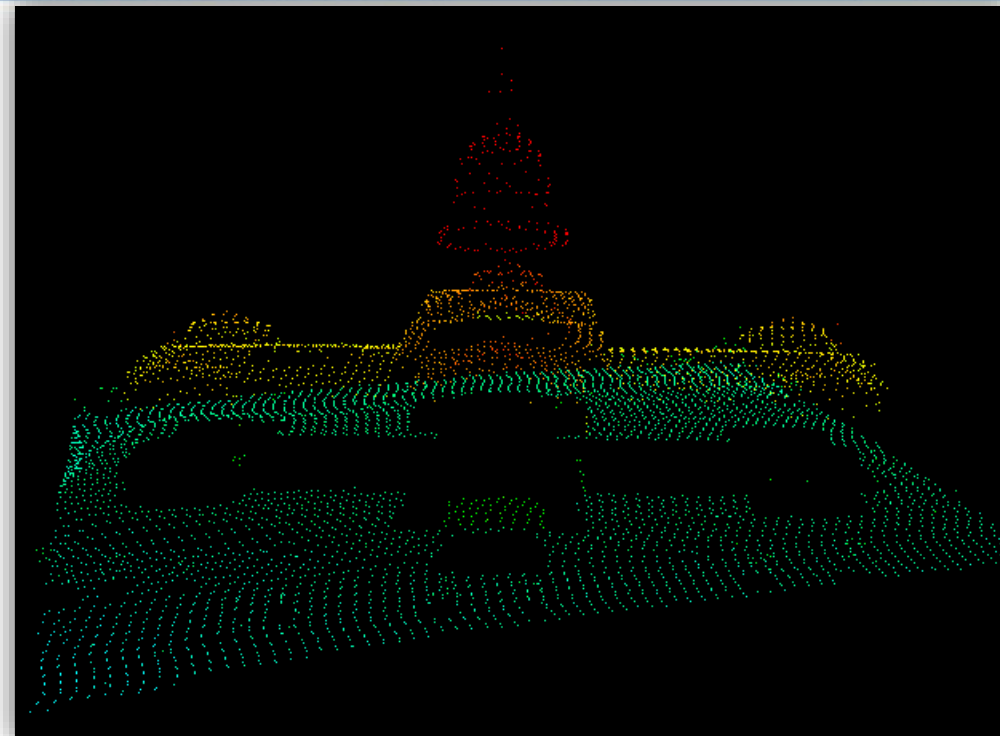


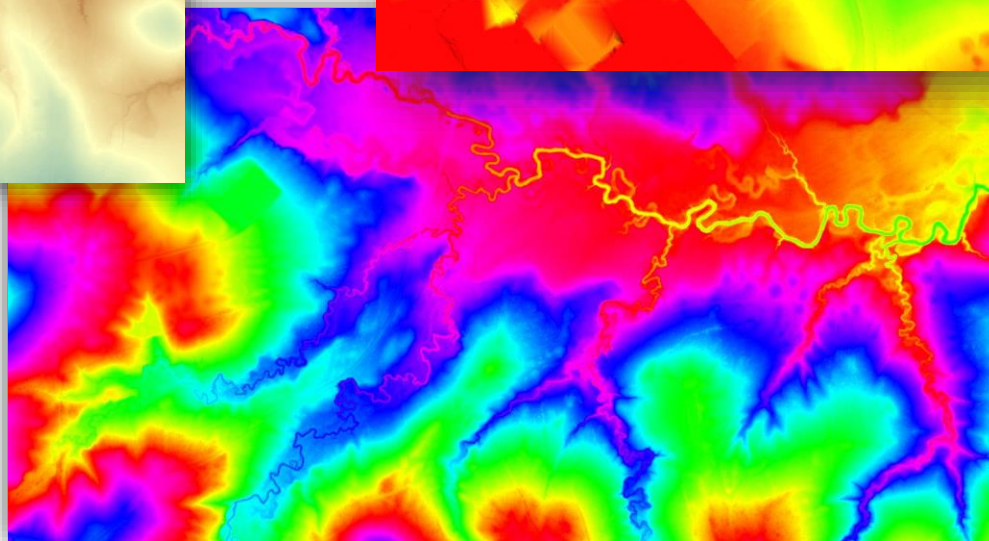
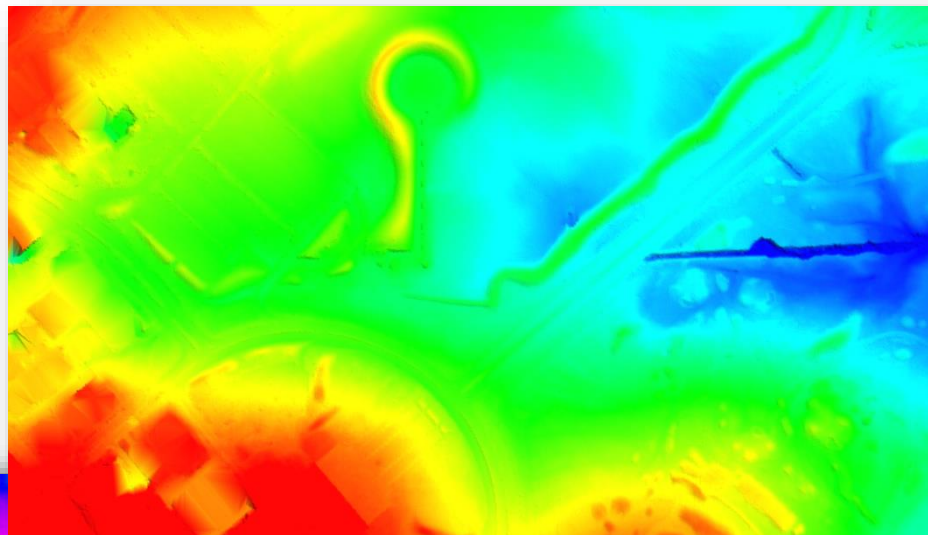
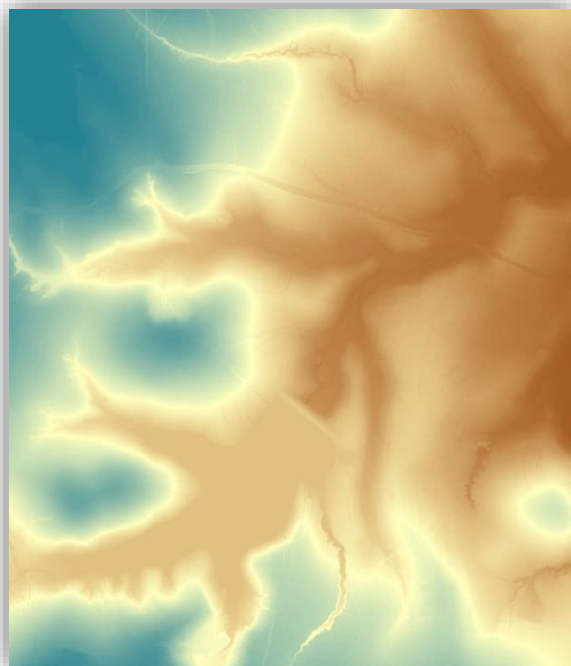
# StratMap Orthoimagery

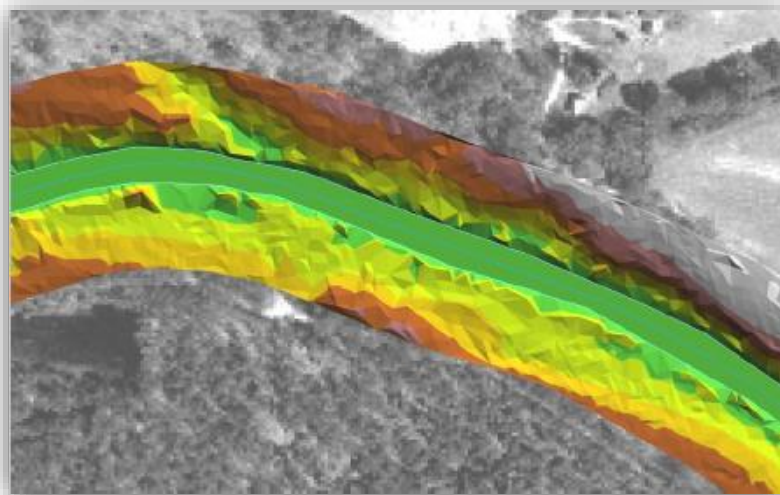
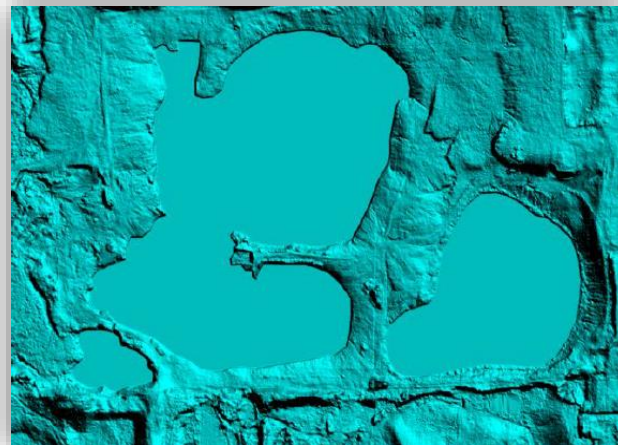
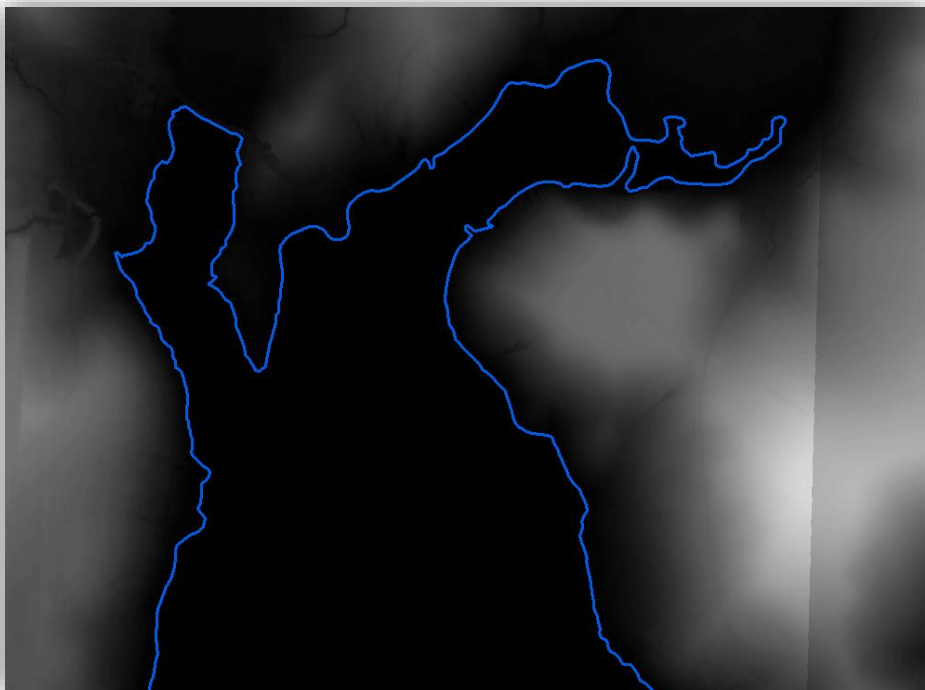


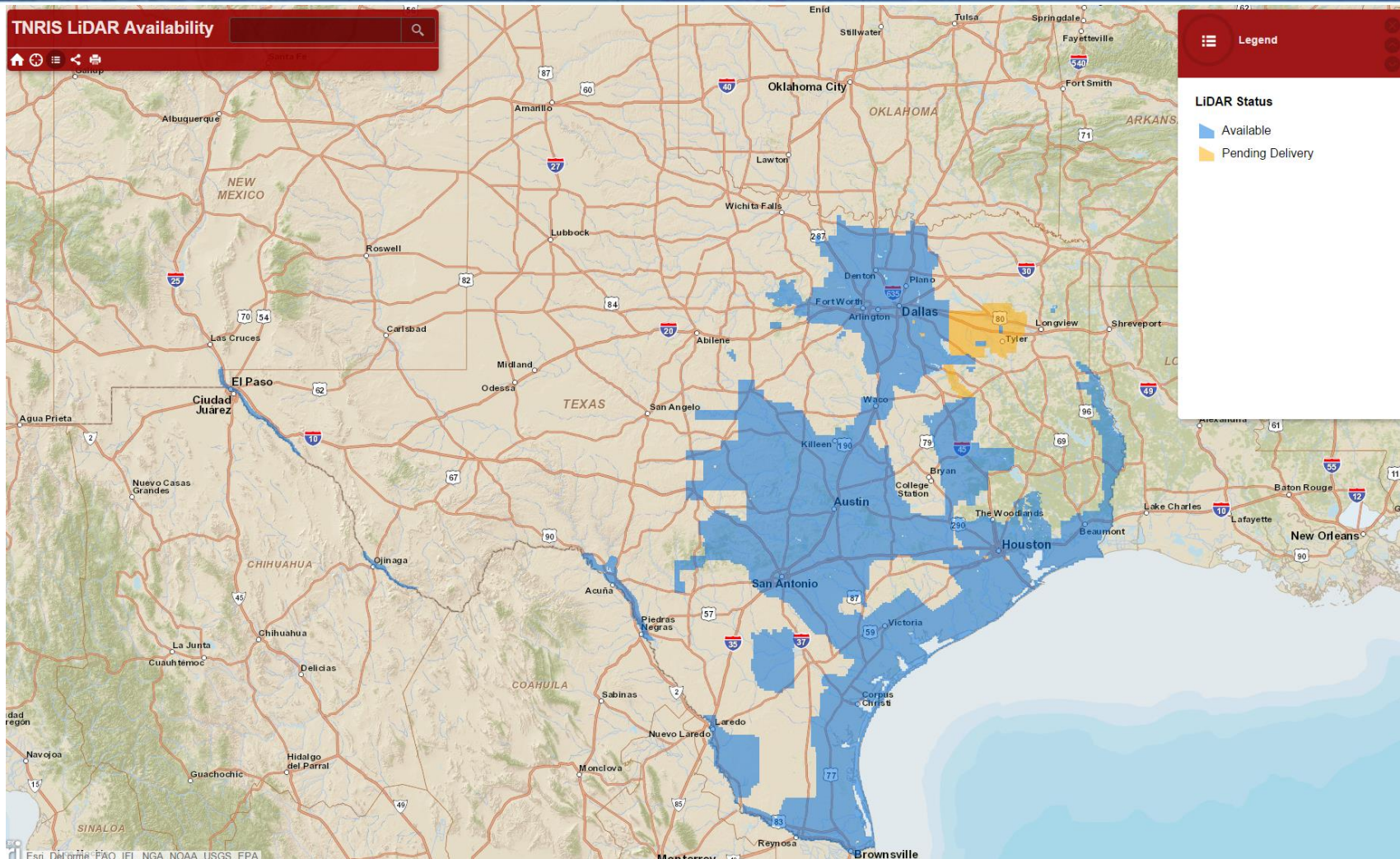
# StratMap Orthoimagery





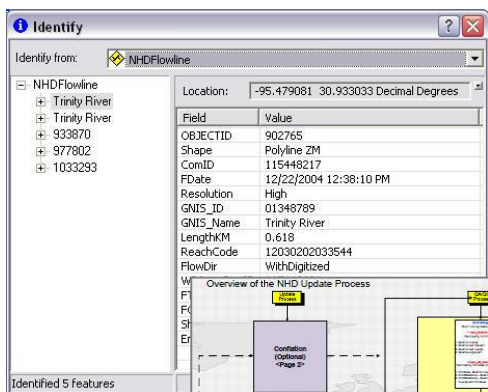




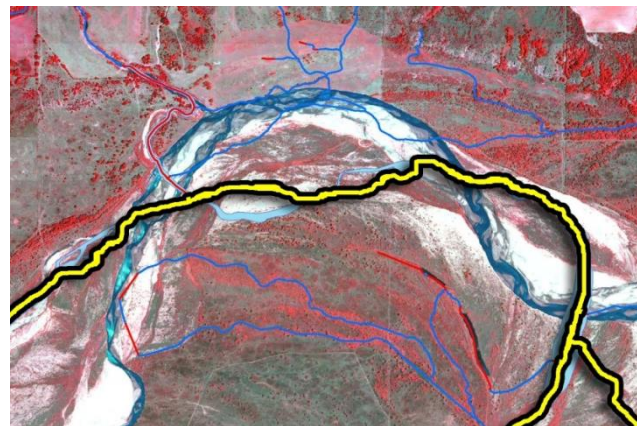


## National Hydrography Dataset (NHD)

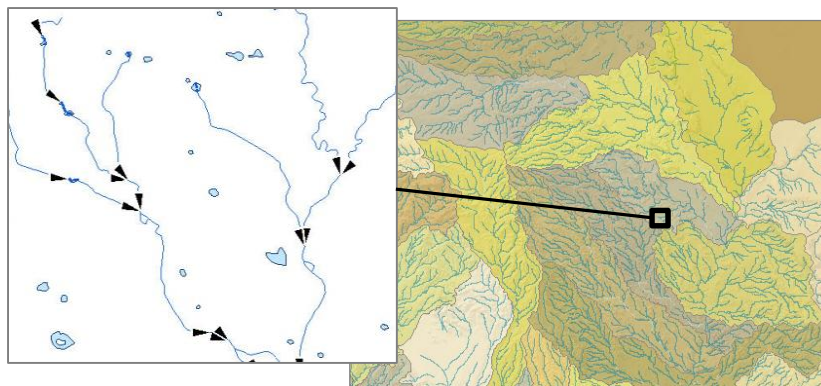
### 2. Database of information describing water features



### 1. Digital map of surface water features

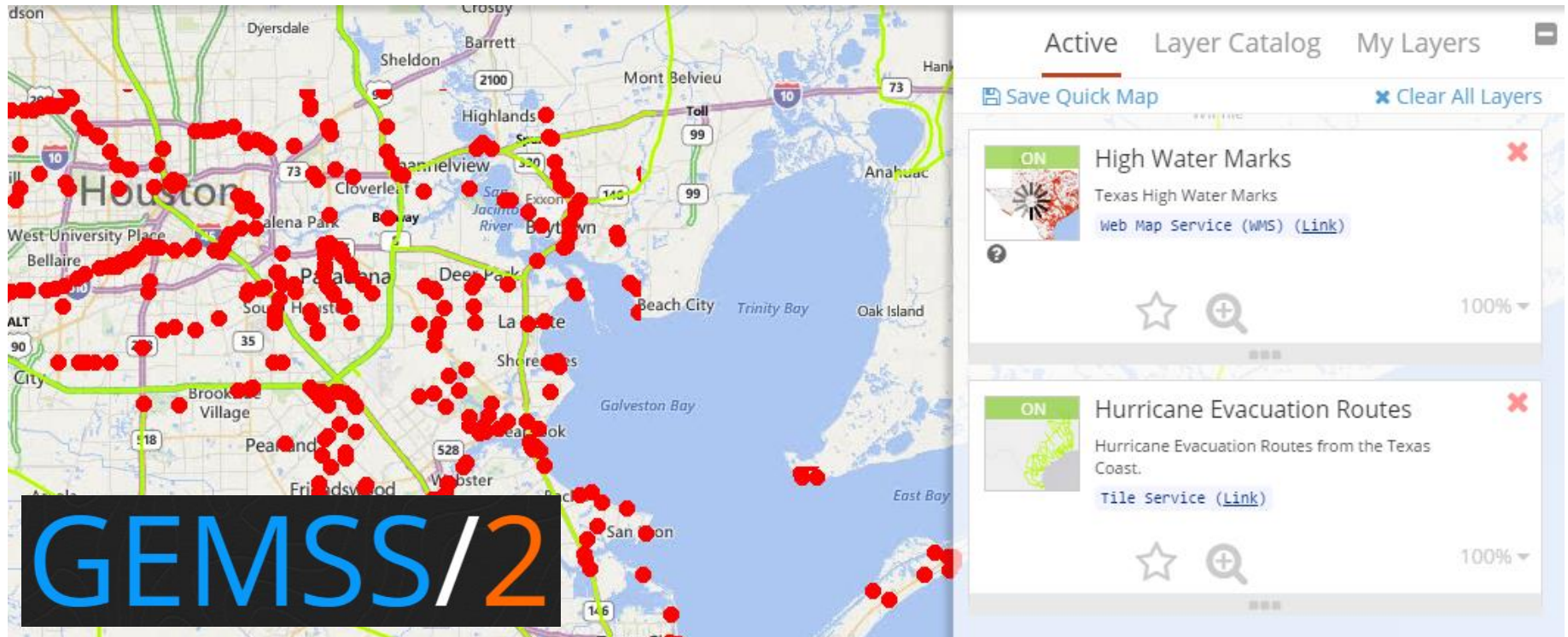


### 3. Relational flow model & watershed characteristics



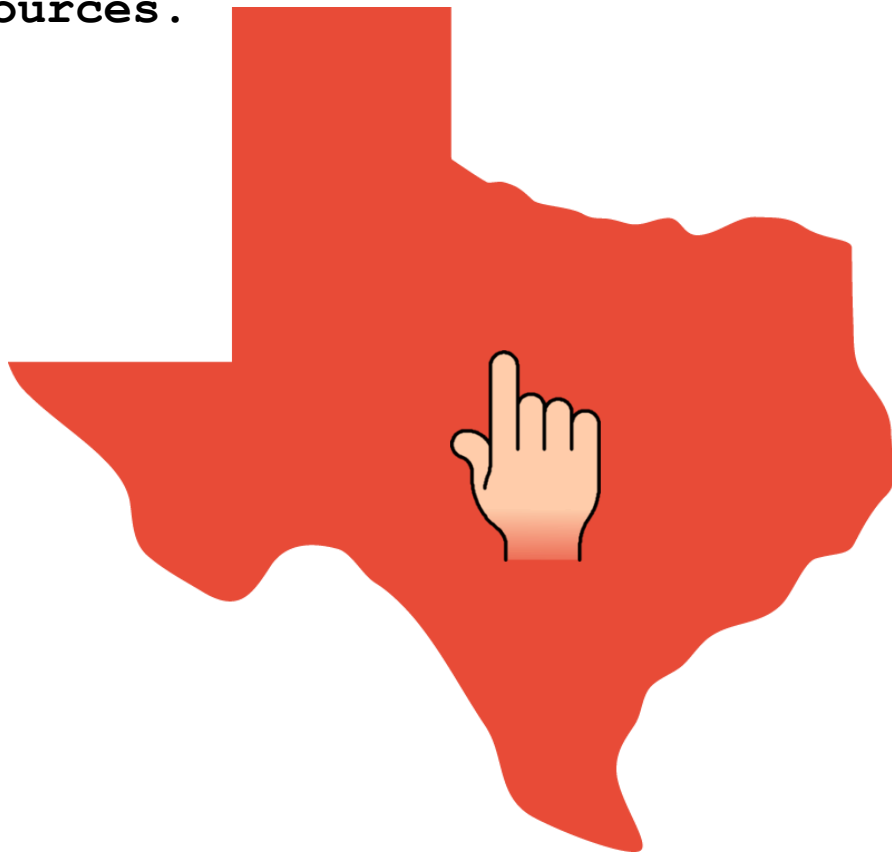
**TEXAS WATER CODE 16.021**

**c. (3) support geographic data needs of emergency management responders during emergencies;**



**Texas Water Code 16.021**

**c. (5) support public access to state geographic data and resources.**



Start exploring our data



**Data Catalog**

Browse data sets



**Download Data**

Access digital data directly



**Order Data**

Custom data requests



**Online Map Services**

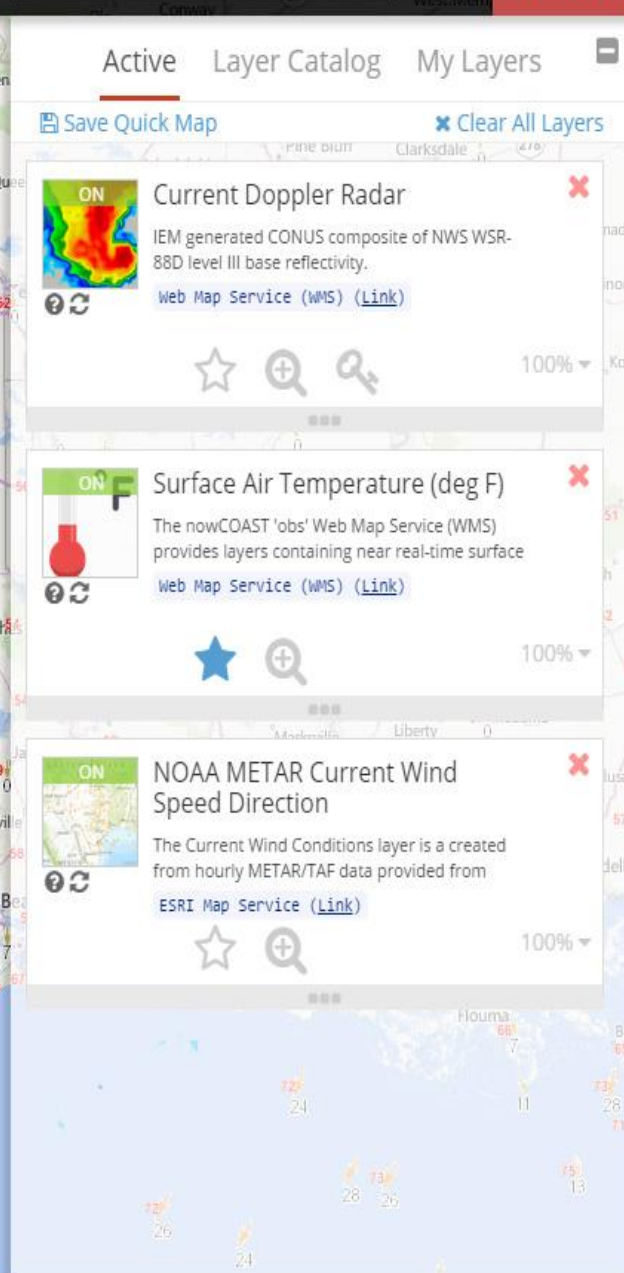
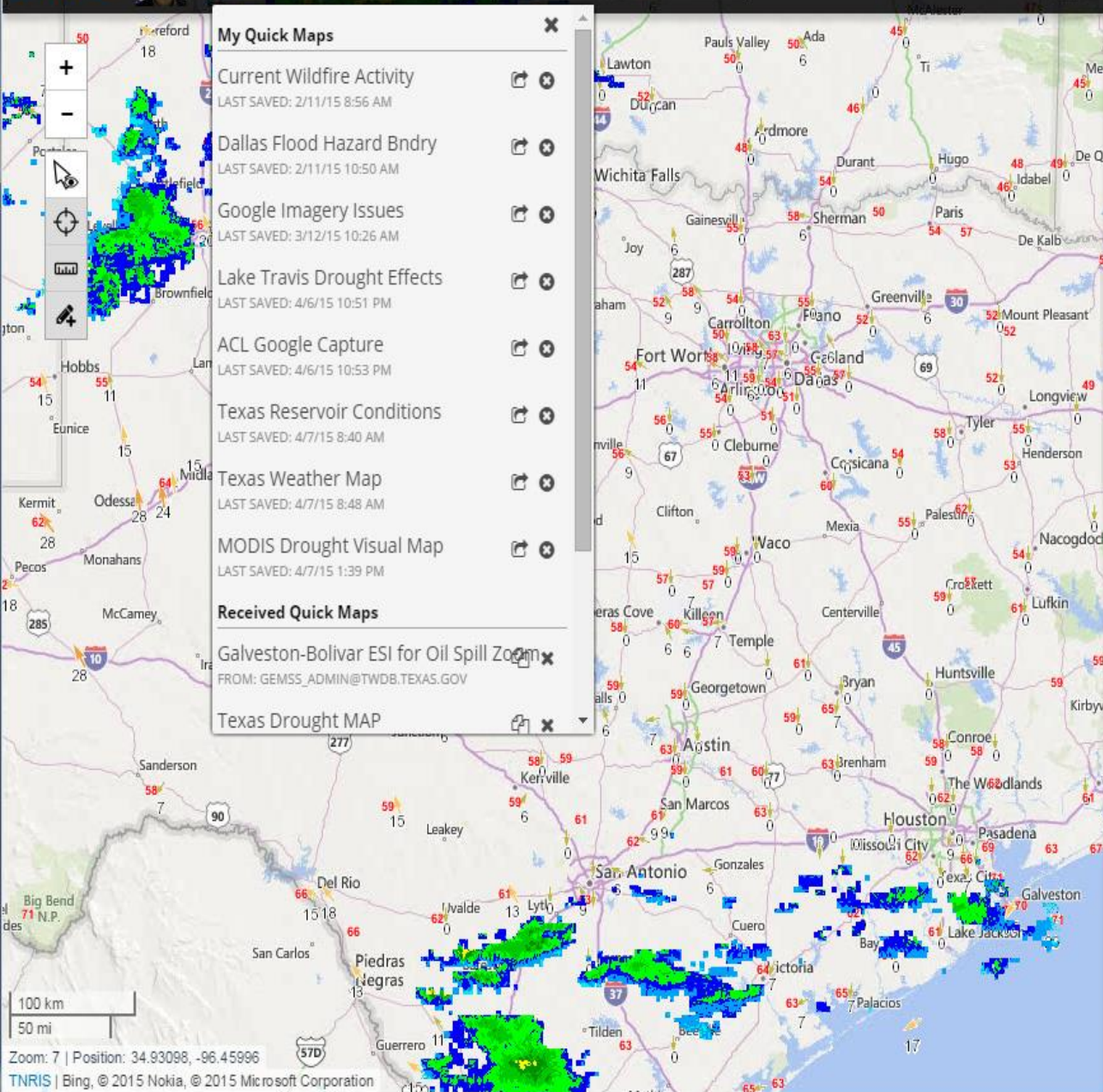
WMS layers and more

# Where are we today?

- GIO position established in 2011 (82 Legislature)
- New GIS governance council est. 2015
- Focus on data service model vs download
- Working with private sector to reduce statewide costs and redundancy.
- Cost share contracting capabilities to leverage statewide partnership participation.

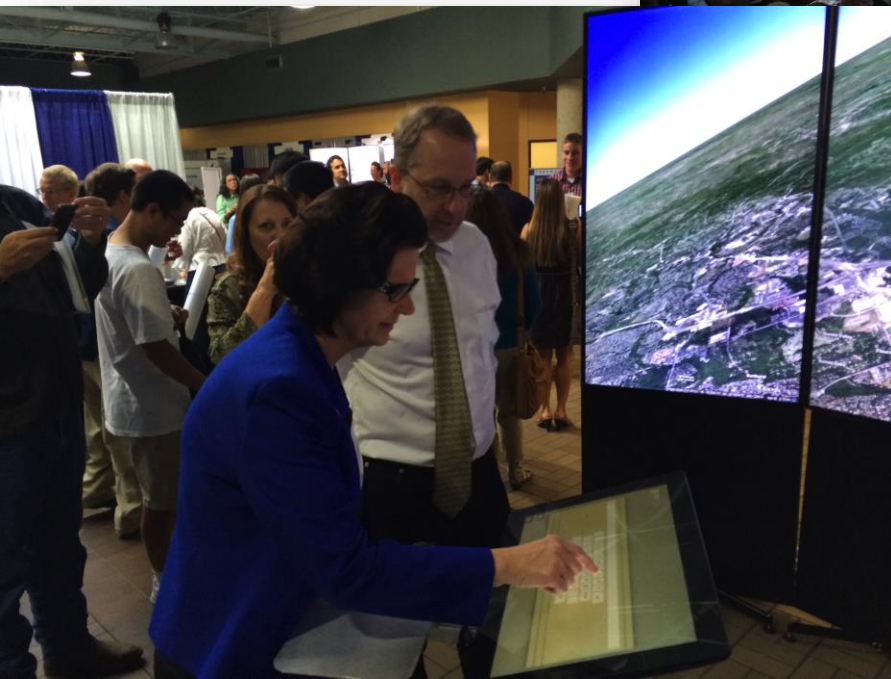
# Where are we going?

- Data Sharing (open data)
- Authoritative data sources
- Build and maintain partnerships (for cost sharing)
- Making recommendations to the Governor relating to the states geospatial needs
- Striving to keep data in the public domain



TEXAS WATER CODE 16.021

c. (4) monitor trends in geographic information technology;





# TEXAS **GIS** FORUM

October 26-29, 2015 / Austin, Texas

## At the Intersection of Geography and Technology

Save the date for the Texas GIS Forum, the premiere, statewide conference dedicated to spatial technology advancements in the government and private sectors.

[Welcome](#)[Call For Presentations](#)

### Keynote Speaker

## David Cowen

Dr. David Cowen is recognized as a Fellow of the UCGIS in recognition of his sustained and effective contributions to the field of Geographic Information Systems and Science. Professor Cowen's contributions in the areas of GIS applications, education, research, government service, and commercial development have had a deep and long-lasting impact upon both geography and GIScience, and on the ways in which GIS is viewed by society.

In addition to a distinguished academic career at the University of South Carolina, Professor Cowen has worked for more than three decades to demonstrate how geographic concepts and GIS can substantially increase the effectiveness of many activities in the public sector.



# 2015 GEORODEO

The Annual Texas GeoDeveloper Roundup  
May 22nd, 2015 | Austin, Texas



## Code, Code on the Range

TNRIS invites you to the 3rd annual GeoRodeo - a roundup of geodevelopers, coders and any professional from across the state of Texas who is looking to incorporate new ideas and creative solutions into their work.


This free, interactive, technical conference, held at the [Commons Center](#) of the JJ Pickle Research Campus, is specifically for the Texas GIS/geospatial developer community.

Join us to learn about tips and techniques for open data, open source, and commercial GIS applications.

## Register for Free on Eventbrite

Registration is required in order to attend and is on a first-come, first-serve basis.

Please register only if you plan on attending.

 [Register for the GeoRodeo](#)

## Keynote Speaker

**Andrew Hill, CartoDB**



**Andrew Hill** is the Chief Science Officer at [CartoDB](#) where he explores the future of online mapping to help guide innovation and education. He is a biologist by training but has been working in maps, GIS, and data visualization for many years.

## Become a Sponsor and Connect with the Texas GeoDeveloper Community

Sponsorship helps us bring exciting speakers and make the GeoRodeo a success.

[Become a Sponsor](#)



Richard Wade – Director of TNRIS and State GIO  
[Richard.Wade@twdb.texas.gov](mailto:Richard.Wade@twdb.texas.gov)

GEMSS is located at: [GEMSS2.tnris.org](http://GEMSS2.tnris.org)

**Please visit us at:  
WWW.TNRIS.ORG**

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